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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WONG, EDNA	

ART UNIT	PAPER NUMBER
1753	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,141	BAJAJ ET AL.	
	Examiner	Art Unit	
	Edna Wong	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *41-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *41-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

This is in response to the Amendment After Final dated July 6, 2004. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The finality of the rejection of the last Office action has been withdrawn in view of the new grounds of rejection.

Response to Arguments

Claim Rejections - 35 USC § 102

I. Claims **1 and 4-6** have been rejected under 35 U.S.C. 102(e) as being anticipated by **Gabe et al.** (US Patent Application Publication No. 2003/0102226 A1).

The rejection of claims 1 and 4-6 under 35 U.S.C. 102(e) as being anticipated by Gabe et al. has been withdrawn in view of Applicants' amendment.

II. Claims **11 and 13-14** have been rejected under 35 U.S.C. 102(e) as being anticipated by **Gabe et al.** (US Patent Application Publication No. 2003/0102226 A1).

The rejection of claims 11 and 13-14 under 35 U.S.C. 102(e) as being anticipated by Gabe et al. has been withdrawn in view of Applicants' amendment.

III. Claims **20-24 and 28** have been rejected under 35 U.S.C. 102(e) as being anticipated by **Gabe et al.** (US Patent Application Publication No. 2003/0102226 A1).

The rejection of claims 20-24 and 28 under 35 U.S.C. 102(e) as being anticipated

by Gabe et al. has been withdrawn in view of Applicants' amendment.

Claim Rejections - 35 USC § 103

I. Claims **7 and 10** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Gabe et al.** (US Patent Application Publication No. 2003/0102226 A1) as applied to claims 1 and 4-6 above.

The rejection of claims 7 and 10 under 35 U.S.C. 103(a) as being unpatentable over Gabe et al. as applied to claims 1 and 4-6 above has been withdrawn in view of Applicants' amendment.

II. Claim **12** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Gabe et al.** (US Patent Application Publication No. 2003/0102226 A1) as applied to claims 11 and 13-14 above.

The rejection of claim 12 under 35 U.S.C. 103(a) as being unpatentable over Gabe et al. as applied to claims 11 and 13-14 above has been withdrawn in view of Applicants' amendment.

III. Claims **29, 31 and 32** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **Naoi et al.** (US Patent Application Publication No. 2003/0059634).

The rejection of claims 29, 31 and 32 under 35 U.S.C. 103(a) as being unpatentable over Naoi et al. has been withdrawn in view of Applicants' amendment.

IV. Claim **33** has been rejected under 35 U.S.C. 103(a) as being unpatentable over **Naoi et al.** (US Patent Application Publication No. 2003/0059634) as applied to claims 29, 31 and 32 above.

The rejection of claim 33 under 35 U.S.C. 103(a) as being unpatentable over Naoi et al. as applied to claims 29, 31 and 32 above has been withdrawn in view of Applicants' amendment.

Allowable Subject Matter

The indicated allowability of claims 8-9, 16-19, 26-27, 30 and 34 is withdrawn in view of the newly discovered reference(s) to **Yanada et al.** (US Patent No. 6,508,927 B2) and **Alling et al.** (US Patent Application Publication No. 2002/0127847 A1). Rejections based on the newly cited reference(s) follow.

Response to Amendment

Claim Rejections - 35 USC § 112

I. Claims **51-56** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for *electrodepositing*, does not reasonably provide enablement for *electrolessly depositing*. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

Claim 51, line 10, recites "depositing the metal ions from the plating solution onto

the substrate". The word "depositing" reads on electrolessly depositing. Applicants' specification discloses that "the invention additionally relate to a plating solution for an electrochemical plating system" (page 4, [0011]). Thus, the claims as presently written are not commensurate in scope with the specification.

II. Claims **41-42, 46 and 55-56** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 41

line 1, it appears that the "metal" is copper because cooper ions are recited in claim 41, line 3 and copper plating is recited in claim 41, line 10. However, it is unclear if it is.

line 11, it appears that "a substrate" is the same as that recited in claim 41, line 1. However, it is unclear if it is. If it is, then it is suggested that the word "a" be amended to the word -- the --.

line 11, it appears that "a metal" is the same as that recited in claim 41, line 1. However, it is unclear if it is. If it is, then it is suggested that the word "a" be amended to the word -- the --.

Claim 42

line 2, the alternative expression of the Markush group is improper. MPEP 2173.05(h). The word "and" should be amended to the word -- or --.

Claim 46

line 12, it is unclear which ions "the metal ions" are further limiting. Is it the copper ions recited in claim 46, line 4; or the metal ions recited in claim 46, line 9?

Claim 55

lines 2-3, it appears that the "organic additives" are the same as that recited in claim 51, lines 6-7. However, it is unclear if they are. If they are, then it is suggested that the word -- the -- be inserted after the word "of".

Claim 56

line 3, "the electrochemical plating solution" lacks antecedent basis.

line 3, the claim does not end in a period.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Method for Plating

I. Claims **41 and 42** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a method for plating metal on a substrate, comprising:

(a) providing a plating solution comprising:

(i) copper ions at a concentration of between about 5 g/L and about 100 g/L (= 0.001-99 g/L of copper salt) [col. 3, lines 3-5];

(ii) an acid at a concentration of between about 5 g/L and about 200 g/L (= 50-600 g/L of an inorganic or organic acid) [col. 4, lines 30-38];

(iii) sodium stannate (col. 2, lines 53-55) at a concentration of between about 500 ppm and about 5000 ppm (= 1-99 g/L of tin salt); and

(iv) at least one organic plating additive to enhance a plating characteristic of copper plating on the substrate (col. 6, lines 26-42); and

(b) contacting a substrate having an electrical bias (= 0.01-100 A/dm^2) [col. 7, lines 31-40] applied thereto with the plating solution to deposit a metal thereon (= a tin-copper alloy deposit) [col. 8, lines 15-29].

The at least one organic plating additive comprises at least one of a leveler, a suppressor, and an accelerator (= leveling agent) [col. 6, lines 26-42].

Yanada does not teach chloride ions at a concentration of between about 10 ppm and about 200 ppm.

However, Alling teaches depositing two materials of different resistivities (page 2, [0022]). The materials comprise tin and copper (page 3, [0029]). The plating baths employ an acidic electrolyte, which typically will be an acidic aqueous solution and that preferably contains a halide ion source, particularly a chloride ion source. A wide range of halide ion concentrations may be utilized, e.g., from about 0 to 100 ppm of halide ion in the plating solution (page 3, [0030]).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Yanada by adding chloride ions at a concentration of between about 10 ppm and about 200 ppm to the plating solution because from about 0 to 100 ppm of chloride ions are typically added to a tin-copper plating bath as taught by Alling (page 3, [0030]).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA

1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

II. Claims **43-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a method for plating metal on a substrate, comprising:

(a) depositing the substrate and an anode in a plating solution (col. 7, lines 31-52), the plating solution comprising:

(i) metal ions (col. 2, lines 56-67);

(ii) an acid (col. 3, lines 10-16);

(iii) one or more organic additives to enhance a plating characteristic (col. 6, lines 43-53); and

(iv) sodium stannate (col. 2, lines 53-55) at a concentration of between about 500 ppm and about 5000 ppm (= 1-99 g/L of tin salt); and

(b) electroplating the metal ions from the plating solution onto the substrate (col. 7, lines 31-52).

The acid has a concentration of between about 5 g/L and about 500 g/L (col. 4, lines 30-38).

Yanada does not teach halide ions; and wherein the halide ions comprise

chloride ions at a concentration of between about 10 ppm and about 200 ppm.

However, Alling teaches depositing two materials of different resistivities (page 2, [0022]). The materials comprise tin and copper (page 3, [0029]). The plating baths employ an acidic electrolyte, which typically will be an acidic aqueous solution and that preferably contains a halide ion source, particularly a chloride ion source. A wide range of halide ion concentrations may be utilized, e.g., from about 0 to 100 ppm of halide ion in the plating solution (page 3, [0030]).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Yanada by adding halide ions; and wherein the halide ions comprise chloride ions at a concentration of between about 10 ppm and about 200 ppm because from about 0 to 100 ppm of chloride ions are typically added to a tin-copper plating bath as taught by Alling (page 3, [0030]).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA

1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

III. Claim **46** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a method for plating metal on a substrate, comprising:

(a) disposing the substrate and an anode in a plating solution (col. 7, lines 31-52) comprising:

(i) copper ions at a concentration of between about 5 g/L and about 100 g/L (= 0.001-99 g/L of copper salt) [col. 3, lines 3-5];

(ii) an acid at a concentration of between about 5 g/L and about 200 g/L (= 50-600 g/L inorganic organic acid) [col. 4, lines 30-38];

(iii) sodium stannate (col. 2, lines 53-55) at a concentration of between about 500 ppm and about 5000 ppm (= 1-99 g/L of tin salt); and

(iv) one or more organic plating additive to enhance a plating characteristic of copper plating on the substrate (col. 6, lines 43-53); and

(b) electroplating the metal ions from the plating solution onto the substrate (col. 7, lines 31-52).

Yanada does not teach chloride ions at a concentration of between about 10

ppm and about 200 ppm metal ions.

However, Alling teaches depositing two materials of different resistivities (page 2, [0022]). The materials comprise tin and copper (page 3, [0029]). The plating baths employ an acidic electrolyte, which typically will be an acidic aqueous solution and that preferably contains a halide ion source, particularly a chloride ion source. A wide range of halide ion concentrations may be utilized, e.g., from about 0 to 100 ppm of halide ion in the plating solution (page 3, [0030]).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Yanada by adding chloride ions at a concentration of between about 10 ppm and about 200 ppm to the plating solution because chloride ions are typically added to a tin-copper plating bath as taught by Alling (page 3, [0030]).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500

USPQ 904 (1991) and MPEP § 2144.

IV. Claims **51-56** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a method for plating metal on a substrate, comprising:

(a) providing a plating solution comprising:

(i) metal ions (col. 2, lines 56-67);

(ii) an acid (col. 3, lines 10-16);

(iii) one or more organic additives configured to enhance one or more plating characteristics [col. 5, lines 43-44 and lines 59-62; col. 6, lines 26-3 and lines 43-45); and

(iv) at least one anti-oxidant at a concentration between about 500 ppm and about 5000 ppm (= 0.001-20 g/L) [col. 6, lines 26-42]; and

(b) depositing the metal ions from the plating solution onto the substrate (col. 7, lines 31-52).

The anti-oxidant is hydroquinone (col. 6, lines 26-37).

Yanada does not teach wherein the anti-oxidant is sodium stannate.

However, the invention as a whole would have been obvious to one having

ordinary skill in the art at the time the invention was made to have modified the method of Yanada with wherein the anti-oxidant is sodium stannate because Yanada teaches 1-99 g/L of sodium stannate (col. 2, lines 53-55; and col. 3, lines 1-2). The reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

As to wherein the anti-oxidant is butylated hydroxyl toluene, Yanada teaches that the plating bath may be incorporated with an antioxidant for Sn^{2+} ion in the plating bath (col. 6, lines 26-31). The antioxidants disclosed by Yanada are exemplary and it is suggested that one having ordinary skill in the art has the skill to select the appropriate antioxidant by routine experimentation based upon the desired reaction occurring since the antioxidant would determine the oxidation of the Sn^{2+} ions in the plating bath.

As to wherein the amount of anti-oxidant added into the plating solution per unit time is calculated to correspond to an amount of organic additives degrading in the plating solution per unit time; and wherein the amount of anti-oxidant is added in an

amount corresponding to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution, Yanada teaches that the plating bath may be applied to rack plating, barrel plating or high-speed plating in the usual way (col. 7, lines 31-33). It is conventional in the art and well within the skill of the artisan to replenish the plating additives that are consumed during the electrolysis.

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

Plating Solution

V. Claim **47** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a plating solution for an electrochemical plating solution, comprising:

(a) a liquid solution containing:

(i) copper ions at a concentration of between about 5 g/L and about 100 g/L (= 0.001-99 g/L of copper salt) [col. 3, lines 3-5];

(ii) an acid (col. 4, lines 30-38);

(iii) at least one organic plating additive to facilitate a plating characteristic of copper ions onto the substrate (col. 6, lines 43-53); and

(iv) sodium stannate (col. 2, lines 53-55) at a concentration of between about 500 ppm and about 5000 ppm (= 1-99 g/L of tin salt).

Yanada does not teach halide ions.

However, Alling teaches depositing two materials of different resistivities (page 2, [0022]). The materials comprise tin and copper (page 3, [0029]). The plating baths employ an acidic electrolyte, which typically will be an acidic aqueous solution and that preferably contains a halide ion source, particularly a chloride ion source. A wide range of halide ion concentrations may be utilized, e.g., from about 0 to 100 ppm of halide ion in the plating solution (page 3, [0030]).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the plating solution of Yanada by having halide ions in the plating solution because halide ions are typically added to a tin-copper plating bath as taught by Alling (page 3, [0030]).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

VI. Claim **48** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a plating solution for an electrochemical plating solution, comprising:

(a) a liquid solution containing:

(i) copper ions at a concentration of between about 5 g/L and about 100 g/L (= 0.001-99 g/L of copper salt) [col. 3, lines 3-5];

(ii) an acid at a concentration of between about 5 g/L and about 200 g/L (= 50-600 g/L inorganic organic acid) [col. 4, lines 30-38];

(iii) at least one organic plating additive to facilitate a plating characteristic of copper ions onto the substrate (col. 6, lines 43-53); and

(iv) sodium stannate (col. 2, lines 53-55) at a concentration of between about 500 ppm and about 5000 ppm (= 1-99 g/L of tin salt).

Yanada does not teach chloride ions at a concentration of between about 10 ppm and about 200 ppm.

However, Alling teaches depositing two materials of different resistivities (page 2, [0022]). The materials comprise tin and copper (page 3, [0029]). The plating baths employ an acidic electrolyte, which typically will be an acidic aqueous solution and that preferably contains a halide ion source, particularly a chloride ion source. A wide range of halide ion concentrations may be utilized, e.g., from about 0 to 100 ppm of halide ion in the plating solution (page 3, [0030]).

Thus, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the plating solution of Yanada by having chloride ions at a concentration of between about 10 ppm and about 200 ppm in the plating solution because from about 0 to 100 ppm of chloride ions are typically added to a tin-copper plating bath as taught by Alling (page 3, [0030]).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same

advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

Method for Reducing

VII. Claim **49** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2).

Yanada teaches a method for reducing degradation of organic plating additives in an electrochemical plating solution, comprising:

adding sodium stannate (col. 2, lines 53-55) to the electrochemical plating solution, the sodium stannate being added in an amount, wherein a concentration of the sodium stannate is between about 500 ppm and about 5000 ppm (col. 3, lines 1-2).

Yanada does not teach wherein the amount corresponds to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method

of Yanada with wherein the amount corresponds to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution because Yanada teaches that the plating bath may be applied to rack plating, barrel plating or high-speed plating in the usual way (col. 7, lines 31-33). It is conventional in the art and well within the skill of the artisan to replenish the plating additives that are consumed during the electrolysis.

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

VIII. Claim **50** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Yanada et al.** (US Patent No. 6,508,927 B2) in combination **Alling et al.** (US Patent Application Publication No. 2002/01277847 A1).

Yanada teaches a method for reducing degradation of organic plating additives in an electrochemical plating solution, comprising:

adding sodium stannate (col. 2, lines 53-55) to the electrochemical plating

solution, the sodium stannate being added in an amount (col. 3, lines 1-2).

The electroplating solution is configured to plate copper (col. 8, lines 20-25).

Yanada does not teach wherein the amount corresponds to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the method of Yanada with wherein the amount corresponds to a time varying amount of degraded organic plating additives generated in the electrochemical plating solution because Yanada teaches that the plating bath may be applied to rack plating, barrel plating or high-speed plating in the usual way (col. 7, lines 31-33). It is conventional in the art and well within the skill of the artisan to replenish the plating additives that are consumed during the electrolysis.

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA

1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

As to wherein the electrochemical plating solution includes chloride ions in a concentration of between about 10 ppm and about 200 ppm, adding from about 0 to 100 ppm of chloride ions to a tin-copper plating bath is typical as taught by Alling (page 3, [0030]).

Alling teaches depositing two materials of different resistivities (page 2, [0022]). The materials comprise tin and copper (page 3, [0029]). The plating baths employ an acidic electrolyte, which typically will be an acidic aqueous solution and that preferably contains a halide ion source, particularly a chloride ion source. A wide range of halide ion concentrations may be utilized, e.g., from about 0 to 100 ppm of halide ion in the plating solution (page 3, [0030]).

Furthermore, the reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by the Applicants. *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991); *In re Linter* 458 F 2d 1013, 173 USPQ 560 (CCPA 1972); *In re Dillon* 919 F 2d 688, 16 USPQ 2d 1897 (Fed. Cir. 1990), cert. denied, 500 USPQ 904 (1991) and MPEP § 2144.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 3:30 pm, Flex Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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EW
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